```
<!--StartFragment-->RESULT 1
ABR55370
    ABR55370 standard; peptide; 58 AA.
ХX
    ABR55370;
AC
XX
DT
     29-JUL-2003 (first entry)
XX
     Amino acid sequence of dortoxin.
DE
XX
KW
    Scorpion; birtoxin; venom; blood brain barrier; ion channel;
KW
     kinin receptor; insecticide; pesticide; dortoxin.
XX
os
     Parabuthus transvaalicus.
XX
    WO2003028666-A2.
PN
XX
    10-APR-2003.
PD
XX
PF
     04-OCT-2002; 2002WO-US031861.
XX
PR
     04-OCT-2001; 2001US-0327602P.
     28-JUN-2002; 2002US-0393070P.
PR
XX
PA
     (REGC ) UNIV CALIFORNIA.
XX
ΡI
     Hammock BD, Inceoglu B;
XX
DR
     WPI; 2003-441071/41.
XX
РΤ
     Novel scorpion birtoxin family polypeptide derived from venom of
PT
     Parabuthus transvaalicus, useful for producing a composition for treating
     diseases or conditions associated with ion channel function or kinin
PT
    activity.
XX
PS
    Claim 6; Page 74; 104pp; English.
XX
CC
     The specification describes a scorpion birtoxin family polypeptide,
CC
    derived from the venom of Parabuthus transvaalicus, separated from its
CC
     natural milieu. The polypeptide is a modulator of the permeability of the
CC
    blood brain barrier. The polypeptide also has an an ion channel binding
CC
     activity of a birtoxin family polypeptide and kinin receptor activity.
CC
    The peptide is useful for modulating the permeability of the blood brain
CC
    barrier. It is also useful for producing pharmaceutical compositions
CC
    which are useful for treating diseases and conditions associated with the
     ion channel function or kinin activity. Antibodies generated using the
CC
     polypeptide are useful for detecting the presence of scorpion venom toxin
CC
     and in altering birtoxin family polypeptide-ion channel binding or kinin
CC
     activity. Antivenom comprising these antibodies is useful as an
CC
     insecticide or pesticide. The present sequence represents dortoxin of
CC
     Parabuthus transvaalicus, a polypeptide of the invention
ХX
SQ
    Sequence 58 AA;
                          66.6%; Score 228.5; DB 6;
                                                       Length 58;
  Best Local Similarity
                          66.1%; Pred. No. 3.1e-19;
  Matches
           37; Conservative
                                 7; Mismatches 11;
                                                      Indels
                                                                 1:
                                                                             1:
                                                                     Gaps
Qу
            1 ADVPGNYPLDSSDNTYLCAPLGDNPDCIKICQKHGVDYGYCYAFQCWC-EFLKDEN 55
              HILLIHILL
                          1 ADVPGNYPLDKDGNTYTCLKLGENKDCQKVCKLHGVQYGYCYAFECWCKEYLDDKD 56
Db
RESULT 2
    ABR55371 standard; peptide; 58 AA.
ID
XX
AC
    ABR55371;
XX
DΤ
     29-JUL-2003 (first entry)
XX
DE
    Amino acid sequence of bestoxin.
XX
     Scorpion; birtoxin; venom; blood brain barrier; ion channel;
KW
ΚW
     kinin receptor; insecticide; pesticide; bestoxin.
XX
```

```
Parabuthus transvaalicus.
OS
XX
     WO2003028666-A2.
PN
XX
PD
     10-APR-2003.
XX
    04-OCT-2002; 2002WO-US031861.
PF
XX
PR
    04-OCT-2001: 2001US-0327602P.
PR
    28-JUN-2002; 2002US-0393070P.
XX
PA
     (REGC ) UNIV CALIFORNIA.
PΙ
    Hammock BD, Inceoglu B;
XX
DR
    WPI; 2003-441071/41.
XX
PT
    Novel scorpion birtoxin family polypeptide derived from venom of
    Parabuthus transvaalicus, useful for producing a composition for treating
PT
PΤ
     diseases or conditions associated with ion channel function or kinin
PT
    activity.
XX
PS
    Claim 6; Page 75; 104pp; English.
XX
CC
    The specification describes a scorpion birtoxin family polypeptide,
    derived from the venom of Parabuthus transvaalicus, separated from its
CC
CC
    natural milieu. The polypeptide is a modulator of the permeability of the
CC
    blood brain barrier. The polypeptide also has an an ion channel binding
    activity of a birtoxin family polypeptide and kinin receptor activity.
CC
CC
    The peptide is useful for modulating the permeability of the blood brain
    barrier. It is also useful for producing pharmaceutical compositions
    which are useful for treating diseases and conditions associated with the
CC
CC
    ion channel function or kinin activity. Antibodies generated using the
CC
    polypeptide are useful for detecting the presence of scorpion venom toxin
CC
    and in altering birtoxin family polypeptide-ion channel.binding or kinin
CC
     activity. Antivenom comprising these antibodies is useful as an
CC
     insecticide or pesticide. The present sequence represents bestoxin of
CC
    Parabuthus transvaalicus, a polypeptide of the invention
XX
SO
     Sequence 58 AA;
                          66.0%; Score 226.5; DB 6;
 Query Match
                                                       Length 58;
 Best Local Similarity
                          66.1%; Pred. No. 5.3e-19;
           37; Conservative
                                 6; Mismatches
                                                       Indels
            1 ADVPGNYPLDSSDNTYLCAPLGDNPDCIKICQKHGVDYGYCYAFQCWC-EFLKDEN 55
Qу
                          111111111
Db.
            1 ADVPGNYPLDKDGNTYTCLELGENKDCQKVCKLHGVQYGYCYAFSCWCKEYLDDKD 56
RESULT 3
ABR55369
    ABR55369 standard; peptide; 58 AA.
ID
XX
AC
    ABR55369;
XX
DT
    29-JUL-2003 (first entry)
DE
    Amino acid sequence of ikitoxin.
XX
KW
     Scorpion; birtoxin; venom; blood brain barrier; ion channel;
KW
     kinin receptor; insecticide; pesticide; ikitoxin.
XX
os
     Parabuthus transvaalicus.
XX
PN
    WO2003028666-A2.
XX
PD
    10-APR-2003.
XX
PF
     04-OCT-2002; 2002WO-US031861.
XX
PR
     04-OCT-2001; 2001US-0327602P.
     28-JUN-2002; 2002US-0393070P.
PR
XX
     (REGC ) UNIV CALIFORNIA.
PA
XX
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PΤ
     Hammock BD, Inceoglu B;
    WPI; 2003-441071/41.
DR
XX
PT
    Novel scorpion birtoxin family polypeptide derived from venom of
PT
    Parabuthus transvaalicus, useful for producing a composition for treating
PT
    diseases or conditions associated with ion channel function or kinin-
PT
    activity.
XX
PS
    Claim 6; Page 73; 104pp; English.
XX
CC
    The specification describes a scorpion birtoxin family polypeptide,
CC
    derived from the venom of Parabuthus transvaalicus, separated from its
CC
    natural milieu. The polypeptide is a modulator of the permeability of the
CC
    blood brain barrier. The polypeptide also has an an ion channel binding
CC
    activity of a birtoxin family polypeptide and kinin receptor activity.
CC
    The peptide is useful for modulating the permeability of the blood brain
CC
    barrier. It is also useful for producing pharmaceutical compositions
CC
    which are useful for treating diseases and conditions associated with the
CC
    ion channel function or kinin activity. Antibodies generated using the
CC
    polypeptide are useful for detecting the presence of scorpion venom toxin
CC
    and in altering birtoxin family polypeptide-ion channel binding or kinin
CC
    activity. Antivenom comprising these antibodies is useful as an
CC
    insecticide or pesticide. The present sequence represents ikitoxin of
CC
    Parabuthus transvaalicus, a polypeptide of the invention
XX
     Sequence 58 AA;
SQ
 Query Match
                          65.3%;
                                  Score 224; DB 6;
                                                     Length 58;
 Best Local Similarity
                          63.0%;
                                 Pred. No. 1e-18;
           34; Conservative
                                 9; Mismatches
 Matches
                                                  11:
                                                      Indels
                                                                             0:
Qу
            1 ADVPGNYPLDSSDNTYLCAPLGDNPDCIKICQKHGVDYGYCYAFQCWCEFLKDE 54
              11111111
                          Dh
            1 ADVPGNYPLDKDGNTYKCFLLGENEECLNVCKLHGVQYGYCYASKCWCEYLEDD 54
RESULT 4
ABR55368
    ABR55368 standard; peptide; 58 AA.
TD
    ABR55368;
AC
XX
DT
     29-JUL-2003 (first entry)
XX
DΕ
    Amino acid sequence of birtoxin.
XX
     Scorpion; birtoxin; venom; blood brain barrier; ion channel;
KW
KW
     kinin receptor; insecticide; pesticide.
XX
OS
    Parabuthus transvaalicus.
XX
    WO2003028666-A2.
PN
XX
PD
     10-APR-2003.
XX
PF
     04-OCT-2002; 2002WO-US031861.
XX
     04-OCT-2001; 2001US-0327602P.
PR
PR
     28-JUN-2002; 2002US-0393070P.
XX
     (REGC ) UNIV CALIFORNIA.
PA
XX
PΙ
    Hammock BD. Inceoglu B:
XX
DR
     WPI; 2003-441071/41.
XX
РΤ
    Novel scorpion birtoxin family polypeptide derived from venom of
     Parabuthus transvaalicus, useful for producing a composition for treating
PT
PT
    diseases or conditions associated with ion channel function or kinin
PT
     activity.
XX
PS
     Claim 6; Page 71; 104pp; English.
XX
     The specification describes a scorpion birtoxin family polypeptide,
CC
CC
     derived from the venom of Parabuthus transvaalicus, separated from its
```

```
CC
     natural milieu. The polypeptide is a modulator of the permeability of the
CC
     blood brain barrier. The polypeptide also has an an ion channel binding
     activity of a birtoxin family polypeptide and kinin receptor activity.
CC
     The peptide is useful for modulating the permeability of the blood brain
CC
    barrier. It is also useful for producing pharmaceutical compositions
    which are useful for treating diseases and conditions associated with the
CC
CC
     ion channel function or kinin activity. Antibodies generated using the
CC
     polypeptide are useful for detecting the presence of scorpion venom toxin
CC
     and in altering birtoxin family polypeptide-ion channel binding or kinin
CC
     activity. Antivenom comprising these antibodies is useful as an
CC
     insecticide or pesticide. The present sequence represents birtoxin of
CC
     Parabuthus transvaalicus, a polypeptide of the invention
XX
SO
     Sequence 58 AA;
  Query Match
                          64.4%; Score 221; DB 6; Length 58;
  Best Local Similarity
                          63.0%; Pred. No. 2.3e-18;
            34; Conservative
                                 8; Mismatches
                                                  12;
                                                      Indels
                                                                     Gaps
                                                                             0;
            1 ADVPGNYPLDSSDNTYLCAPLGDNPDCIKICQKHGVDYGYCYAFQCWCEFLKDE 54
Qу
                         111111111
Db
            1 ADVPGNYPLDKDGNTYKCFLLGGNEECLNVCKLHGVQYGYCYASKCWCEYLEDD 54
RESULT 5
AAB20075
     AAB20075 standard; protein; 89 AA.
ID
XX
AC
     AAB20075;
XX
DT
     11-SEP-2003 (revised)
DT
     23-APR-2001 (first entry)
XX
DE
     Scorpion sodium channel agonist (insecticidal toxin).
XX
KW
     Scorpion; venom; toxin; sodium channel agonist; anticonvulsant;
KW
     nootropic; cerebroprotective; insecticide.
XX
os
     Hottentotta judaica.
XX
FH
     Key
                     Location/Qualifiers
FT
     Peptide
                     1. .21
                     /label= Sig_peptide
FT
FT
     Protein
                     22. .89
                     /label= Mature_protein
FT
XX
PN
     WO200078957-A2.
XX
PD
     28-DEC-2000.
XX
     21-JUN-2000; 2000WO-US017048.
PF
XX
PR
     22-JUN-1999;
                    99US-0140410P.
XX
PA
     (DUPO ) DU PONT DE NEMOURS & CO E I.
XX
PΙ
     Herrmann R, Lee J, Wong JF;
XX
DR
     WPI; 2001-050111/06.
DR
     N-PSDB; AAA89397.
XX
     New isolated polynucleotide encoding a scorpion toxin for treating
PT
PT
     epilepsy, degenerative disorders such as Huntington's disease, and
     neuronal death following stroke, and for creating plants that are insect-
PT
PT
     tolerant.
XX
PS
     Claim 10; Page 56-57; 60pp; English.
XX
CC
     The present sequence is that of a scorpion (Buthotus judaicus) venom
     protein showing 29.7% identity to an insecticidal toxin of Orthochirus
CC
CC
     scrobiculosus. The sequence was predicted from a cDNA clone (see
CC
     AAA89397) isolated from the scorpion telson cDNA library. The invention
CC
     provides isolated nucleic acid sequences (see AAA89386-400) encoding
CC
     scorpion toxins (see AAB20064-78) that are sodium channel modifiers. The
CC
     invention also relates to the construction of a chimeric gene encoding
     all or part of the sodium channel modifier, in sense or antisense
```

```
CC
     orientation, where expression of the chimeric gene results in production
     of altered levels of the sodium channel modifier in a transformed host
CC
CC
     cell. Sodium channel modifiers can be used to treat neurological problems
     involving abnormal functioning of excitory amino acid synapses, e.g.
CC
     epilepsy, Huntington's disease and neuronal death following stroke.
CC
     Genetically engineered recombinant baculoviruses which express protein
CC
     toxins capable of incapacitating an insect host can be used as biological
CC
     insecticides. The nucleic acids can be used to create transgenic plants
     in which sodium channel agonists of the invention are expressed for
CC
CC
     improved insect tolerance. (Updated on 11-SEP-2003 to standardise OS
CC
     field)
XX
SQ
     Sequence 89 AA;
  Query Match
                          48.0%; Score 164.5; DB 4;
  Best Local Similarity
                          45.6%; Pred. No. 1.7e-11;
  Matches 26; Conservative
                                 9; Mismatches
                                                 21:
                                                       Indels
Qу
            2 DVPGNYPLDSSDNTYLCAPLGDNPDCIKICQKHGVDYGYCYAFQCWCEFLKDENVKV 58
                                    1: 11: 111 1111:
               1 11111:
                           : 1 1
                                                          Db
           24 DTPGNYPISVYGTSYGCTAFNHN-YCVDICKVHGVKYGYCWVTSCWCEYLKKEDIDI 79
RESULT 6
AAB20077
     AAB20077 standard; protein; 89 AA.
TD
     AAB20077;
AC
XX
     11-SEP-2003 (revised)
DT
DT
     23-APR-2001 (first entry)
XX
DE
     Scorpion sodium channel agonist (insecticidal toxin).
XX
KW
     Scorpion; venom; toxin; sodium channel agonist; anticonvulsant;
KW
     nootropic; cerebroprotective; insecticide.
XX
os
     Hottentotta judaica.
XX
FΗ
                     Location/Qualifiers
     Key
FT
     Peptide
                     1. .21
                     /label= Sig_peptide
FT
FT
                     22. .89
     Protein
FT
                     /label= Mature_protein
XX
PN
     WO200078957-A2.
XX
PD
     28-DEC-2000.
XX
PF
     21-JUN-2000; 2000WO-US017048.
хx
PR
     22-JUN-1999;
                    99US-0140410P.
xx
     (DUPO ) DU PONT DE NEMOURS & CO E I.
PA
XX
PΙ
     Herrmann R, Lee J, Wong JF;
XX
DR
     WPI; 2001-050111/06.
DR
     N-PSDB; AAA89399.
XX
PT
     New isolated polynucleotide encoding a scorpion toxin for treating
PT
     epilepsy, degenerative disorders such as Huntington's disease, and
РТ
     neuronal death following stroke, and for creating plants that are insect-
PT
     tolerant.
XX
PS
     Claim 10; Page 57-58; 60pp; English.
XX
CC
     The present sequence is that of a scorpion (Buthotus judaicus) venom
CC
     protein showing 29.6% identity to an insecticidal toxin of Orthochirus
CC
     scrobiculosus. The sequence was predicted from a cDNA clone (see
CC
     AAA89399) isolated from the scorpion telson cDNA library. The invention-
CC
     provides isolated nucleic acid sequences (see AAA89386-400) encoding
     scorpion toxins (see AAB20064-78) that are sodium channel modifiers. The
CC
CC
     invention also relates to the construction of a chimeric gene encoding
CC
     all or part of the sodium channel modifier, in sense or antisense
     orientation, where expression of the chimeric gene results in production
```

```
CC
     of altered levels of the sodium channel modifier in a transformed host
CC
     cell. Sodium channel modifiers can be used to treat neurological problems
     involving abnormal functioning of excitory amino acid synapses, e.g.
CC
     epilepsy, Huntington's disease and neuronal death following stroke.
CC
     Genetically engineered recombinant baculoviruses which express protein
CC
     toxins capable of incapacitating an insect host can be used as biological
CC
     insecticides. The nucleic acids can be used to create transgenic plants
CC
     in which sodium channel agonists of the invention are expressed for
CC
     improved insect tolerance. (Updated on 11-SEP-2003 to standardise OS
CC
XX
so
     Sequence 89 AA;
                          47.1%; Score 161.5; DB 4; 45.5%; Pred. No. 3.7e-11;
 Query Match
                                                        Length 89;
  Best Local Similarity
           25; Conservative
                               11; Mismatches
                                                        Indels
                                                                              1:
                                                  18;
                                                                  1;
                                                                      Gaps
Qу
            4 PGNYPLDSSDNTYLCAPLGDNPDCIKICQKHGVDYGYCYAFQCWCEFLKDENVKV 58
                         :11
                                 Db
           26 PGNYPISIYGQSYGCTS-SDHDYCADICKVHGVNYGYCWVTSCWCEYLKEEDINI 79
RESULT 7
AAB20076
ΙD
     AAB20076 standard; protein; 89 AA.
   . AAB20076;
AC
XX
DT
    .11-SEP-2003
                  (revised)
     23-APR-2001 (first entry)
DΤ
XX
     Scorpion sodium channel agonist (insecticidal toxin).
DE
XX
KW
     Scorpion; venom; toxin; sodium channel agonist; anticonvulsant;
KW
     nootropic; cerebroprotective; insecticide.
XX
os
     Hottentotta judaica.
XX
FH
                     Location/Qualifiers
     Kev
FT
     Peptide
                     1. .21
FT
                     /label= Sig_peptide
     Protein
                     22. .89
FT
                     /label= Mature_protein
XX
PN
     WO200078957-A2.
хx
PD
     28-DEC-2000.
XX
PF
     21-JUN-2000; 2000WO-US017048.
XX
     22-JUN-1999;
                    99US-0140410P.
PR
XX
     (DUPO ) DU PONT DE NEMOURS & CO E I.
PA
XX
ΡI
     Herrmann R, Lee J, Wong JF;
XX
DR
     WPI; 2001-050111/06.
DR
     N-PSDB; AAA89398.
XX
PT
     New isolated polynucleotide encoding a scorpion toxin for treating
PT
     epilepsy, degenerative disorders such as Huntington's disease, and
РТ
     neuronal death following stroke, and for creating plants that are insect-
PT
     tolerant.
XX
PS
     Claim 10; Page 57; 60pp; English.
XX
     The present sequence is that of a scorpion (Buthotus judaicus) venom
CC
CC
     protein showing 29.6% identity to an insecticidal toxin of Orthochirus
CC
     scrobiculosus. The sequence was predicted from a cDNA clone (see
CC
     AAA89398) isolated from the scorpion telson cDNA library. The invention
CC
     provides isolated nucleic acid sequences (see AAA89386-400) encoding
CC
     scorpion toxins (see AAB20064-78) that are sodium channel modifiers. The
CC
     invention also relates to the construction of a chimeric gene encoding
     all or part of the sodium channel modifier, in sense or antisense
CC
     orientation, where expression of the chimeric gene results in production
     of altered levels of the sodium channel modifier in a transformed host
```

```
cell. Sodium channel modifiers can be used to treat neurological problems
CC
     involving abnormal functioning of excitory amino acid synapses, e.g.
     epilepsy, Huntington's disease and neuronal death following stroke.
CC
CC
     Genetically engineered recombinant baculoviruses which express protein
     toxins capable of incapacitating an insect host can be used as biological
     insecticides. The nucleic acids can be used to create transgenic plants
CC
CC
     in which sodium channel agonists of the invention are expressed for
CC
     improved insect tolerance. (Updated on 11-SEP-2003 to standardise OS
CC
     field)
SO
     Sequence 89 AA;
  Query Match
                          44.5%; Score 152.5; DB 4;
                                                       Length 89;
  Best Local Similarity 43.6%; Pred. No. 4.3e-10;
           24; Conservative
                               11; Mismatches
                                                  19;
                                                       Indels
                                                                  1;
Qу
            4 PGNYPLDSSDNTYLCAPLGDNPDCIKICQKHGVDYGYCYAFQCWCEFLKDENVKV 58
                         :1 1
                                  1111:11:1:::::
           26 PGNYPISIYGKSYGCTS-SYHDYCADICKVHGVNYGYCWVTSCWCEYLKEEDINI 79
Db
RESULT 8
AAB20078
     AAB20078 standard; protein; 89 AA.
ID
XX
AC
     AAB20078;
XX
ÐΤ
     11-SEP-2003
                  (revised)
     23-APR-2001 (first entry)
DT
XX
DE
     Scorpion sodium channel agonist (insecticidal toxin).
XX
KW
     Scorpion; venom; toxin; sodium channel agonist; anticonvulsant;
KW
     nootropic; cerebroprotective; insecticide.
XX
os
     Hottentotta judaica.
XX
FH
                     Location/Qualifiers
FT
     Peptide
                     1. .21
FT
                     /label= Sig_peptide
FT
     Protein
                     22. .89
                     /label= Mature protein
XX
PN
     WO200078957-A2.
ХX
PΩ
     28-DEC-2000.
xx
     21-JUN-2000; 2000WO-US017048.
PF
XX
PR
     22-JUN-1999;
                    99US-0140410P.
XX
PΑ
     (DUPO ). DU PONT DE NEMOURS & CO E I.
XX
PΙ
     Herrmann R, Lee J, Wong JF;
XX
     WPI; 2001-050111/06.
DR
DR
     N-PSDB; AAA89400.
XX
РΨ
     New isolated polynucleotide encoding a scorpion toxin for treating
PT
     epilepsy, degenerative disorders such as Huntington's disease, and
PT
     neuronal death following stroke, and for creating plants that are insect-
PT
     tolerant.
XX
PS
     Claim 10; Page 58; 60pp; English.
XX
CC
     The present sequence is that of a scorpion (Buthotus judaicus) venom
CC
     protein showing 29.6% identity to an insecticidal toxin of Orthochirus
CC
     scrobiculosus. The sequence was predicted from a cDNA clone (see
CC
     AAA89400) isolated from the scorpion telson cDNA library. The invention
CC
     provides isolated nucleic acid sequences (see AAA89386-400) encoding
CC
     scorpion toxins (see AAB20064-78) that are sodium channel modifiers. The
CC
     invention also relates to the construction of a chimeric gene encoding
CC
     all or part of the sodium channel modifier, in sense or antisense
CC
     orientation, where expression of the chimeric gene results in production
CC
     of altered levels of the sodium channel modifier in a transformed host
     cell. Sodium channel modifiers can be used to treat neurological problems
```

```
CC
     involving abnormal functioning of excitory amino acid synapses, e.g.
     epilepsy, Huntington's disease and neuronal death following stroke.
     Genetically engineered recombinant baculoviruses which express protein
     toxins capable of incapacitating an insect host can be used as biological
     insecticides. The nucleic acids can be used to create transgenic plants
     in which sodium channel agonists of the invention are expressed for
CC
     improved insect tolerance. (Updated on 11-SEP-2003 to standardise OS
CC
     field)
xx
SQ
     Sequence 89 AA;
                          44.5%; Score 152.5; DB 4; Length 89;
 Query Match
  Best Local Similarity 43.6%; Pred. No. 4.3e-10;
           24; Conservative
                               11; Mismatches
Qу
            {\tt 4~PGNYPLDSSDNTYLCAPLGDNPDCIKICQKHGVDYGYCYAFQCWCEFLKDENVKV~58}
                                 : | ||: |||:||:|:
                                                       1111:11:1:::::
           26 PGNYPISIYGKSYGCTS-SYHDYCADICKVHGVNYGYCWVTSCWCEYLKEEDINI 79
Db
<!--EndFragment-->
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